

CLAIMS

- 5 1. A smartcard comprising a substrate having a smartcard chip thereon, the smartcard being characterised in that it comprises a secondary memory device on the substrate and operatively connected to the smartcard chip.
2. A smartcard according to claim 1 wherein the secondary memory device is a FLASH ROM.
- 10 3. A smartcard according to claim 1 or 2 wherein the secondary memory device is capable of storing a plurality of pages of data, each having associated with it a unique sequence number, the sequence number being stored separately from the data page so that when the page is to be read, the sequence number retrieved with the page can be compared with
15 the stored sequence number to authenticate the page.
4. A smartcard according to claim 3 wherein the stored sequence number is stored in the smartcard chip.
- 20 5. A smartcard according to claim 3 wherein some of the stored sequence numbers are stored in at least one page of the plurality of pages of data stored on the secondary memory device, the sequence number for that at least one page being stored in the smartcard chip
- 25 6. A smartcard according to claim 3 wherein the sequence numbers are XOR'd to produce a digest or HASH which is stored in the smartcard EEPROM
- 30 7. A smartcard according to any of claims 3 to 5 wherein the sequence number associated with a particular page of data is changed each time the page is modified or updated.
- 35 8. A smartcard according to any of claims 3 to 6 wherein the sequence number for each page of data is set initially at a randomly generated value.
9. A smartcard according to any of claims 3 to 8 wherein each page contains a copy of its page number.
- 40 10. A smartcard according to any of claims 3 to 9 wherein the data in each page is encrypted.

11. A smartcard according to any of claims 3 to 10 wherein each page data integrity is protected with a cryptographic MAC.
- 5 12. A smartcard according to any of claims 3 to 11 wherein each page encryption and MAC is performed using a page and chip unique key.